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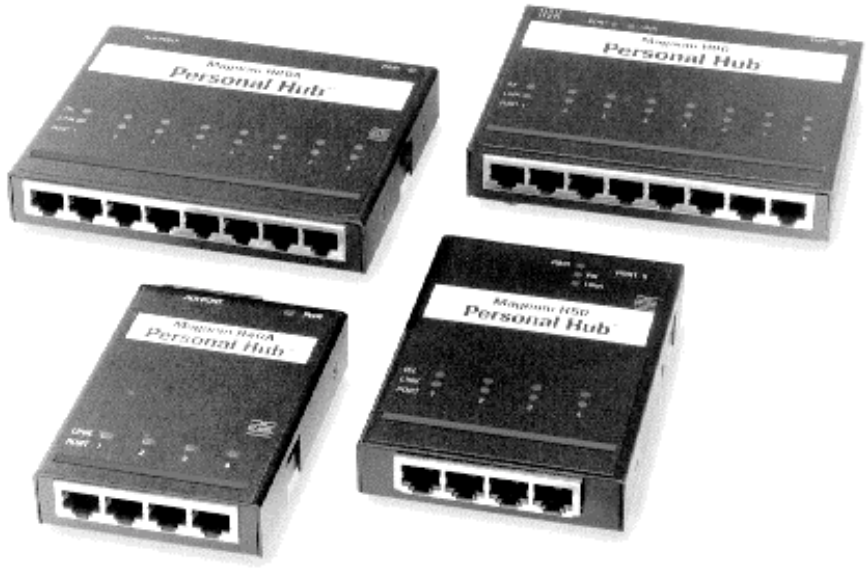
GarrettCom®

Industrial Networking at Its Best℠

Magnum
Personal Hubs



Installation and User Guide

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Magnum™ Personal Hub™

Installation and User Guide

Part #: 84-00023 (Rev B)

Trademarks

Ethernet is a trademark of Xerox Corporation

NEBS is a trademark of Telcordia Technologies

UL is a registered trademark of Underwriters Laboratories

GarrettCom, Magnum and **Personal Switch** are trademarks and **Personal Hub** is a registered trademark of GarrettCom, Inc.

Important: Magnum Personal Hubs contain no user serviceable parts. Attempted service by unauthorized personnel shall render any and all warranties null and void. If problems are experienced with a Magnum Personal Hub, consult Section 5, troubleshooting, of this User Guide.

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Federal Communications Commission

Radio Frequency Interference Statement

This equipment generates, uses and can radiate frequency energy and if not installed and used properly, that is in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

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Revisions

Rev C 04/01: Change the company name to GarrettCom, Inc. (Formerly it was Garrett Communications). There are no changes to the content of the material at this time.

Rev A 04/97 : This revision is the initial release of the Magnum Personal Hub user manual.

The Magnum Line

ETHERNET CONNECTIVITY PRODUCTS

"DESIGNED AND MANUFACTURED IN THE USA"

OVERVIEW

GarrettCom, Inc.offers the premium-quality Magnum™ line of Ethernet LAN connectivity products with industry-standard functionality and built-in fiber configurability. Magnum products are designed for use in demanding Carrier Class, Industrial Grade and OEM applications where reliability is a primary consideration.

4K-Series Switches, 100 & 10Mbps, copper ports with optional fiber port, with auto-negotiating full switching performance

Quad-Series Fiber Switches, 100 & 10Mbps, fiber and copper ports, mixed-speed and mixed-media types, full switching performance

"Outdoor" Ethernet Switch, for temperature uncontrolled locations
6 10/100 and 2 100Mb fiber ports, can be connected in strings

Mixed-Media Fiber Hub, 16-port Stackable, 10/100 auto-sensing

Dual Speed 8-port and 16-port Stackables, 10/100 auto-sensing

Stackable Hubs, SNMP Optional
10Mb series and 100Mb series, both w/ optional port modules

Personal Switches, 10/100Mb
8 port dual speed, Auto-negotiable with fiber option

Personal Hubs, 100Mb or 10/100Mb
8-port, with two switched ports (1 fiber built in)

Personal Hubs, 10Mb series
8-port + AUI, stackable to 5 high, + optional BNC of fiber port
8 or 9-port and 4 or 5-Port Personal Hubs, w/ man. up-link sw.

Media Converters, 10Mb and 100Mb series
All media combinations, incl. fiber ST, SC, mm., single mode

The "X-line" of configurable MiXed Media products:
Stackable Concentrators, SNMP optional, 13-Ports
Mini-Concentrators, 7 Ports, **Repeaters**, 2-Ports
Repeater Port Modules (RPMs), 6 types for Ethernet media
Bridge Port Modules (BPMs), 4 types, for segment isolation

Fan-Outs, 10Mb series
2, 4 and 8 Port Models

Transceivers, 10Mb and 100Mb series 10Mb Mini-Transceivers and Coax Models, All Types -

Apr, 01

1.0 SPECIFICATIONS

1.1. Technical Specifications

Performance:

Data Rate: 10 Mbps
Partitioning: Enforced after 32 consecutive collisions.
Reconnect: Occurs after 512 bits error-free transmission.

Maximum Ethernet Segment Lengths:

10BASE-T (Unshielded twisted pair) - 100 m (328 ft)
10BASE-T (Shielded twisted pair) - 150m (492 ft)
AUI Drop Cable - 50 m (164 ft)

Network Standards:

Ethernet V1.0/2.0 IEEE 802.3: 10BASE-T, 10BASE5.
(Magnum Personal Hubs are physical layer standard Ethernet products, and operate in networks independently of all software.)

Operating Environment:

Ambient Temperature: 32°F to 122°F (0°C to 50°C)
Storage Temperature: -20°C to 60°C
Ambient Relative Humidity: 10% - 95% (non-condensing)

Power Supply (External):

Power Input: 95 - 125 vac at 60 Hz for "-d" Models,
200 - 250 vac at 50 Hz for "-i" Models, which have IEC power cable connector in the external power unit.
Power Consumption: H40A, H50: 6 watts max.; H80A, H90: 10 watts max.

Connectors:

H40A: 4 front shielded RJ-45 (1 with up-link switch), 1 rear AUI, female with slide lock.
H50: 4 front shielded, RJ-45, 1 rear shielded RJ-45 with up-link switch.
H80A: 8 front shielded RJ-45 (1 with up-link switch), 1 rear AUI, female with slide lock.
H90: 8 front shielded RJ-45, 1 rear shielded RJ-45 with up-link switch.
(Shielded 10BASE-T connectors accept either unshielded or shielded wiring lugs for standard twisted pair media wiring.)

The regular RJ-45 ports support the standard for hubs-to-users twisted pair wiring: pin 1= receive+, 2 = receive-, 3 = transmit+, 6 = transmit-, other pins not used. The RJ-45 port with the MDI-X switch is normally the same, but when switched it supports the standard for up-links using twisted pair wiring, i.e., the transmit and the receive pairs are exchanged: pin 1 = transmit+, 2 = transmit-, 3 = receive+, 6 = receive- , other pins not used.

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Switches:

Up-Link: MDI-X (Media Dependent Interface-Crossover)
manual slide switch, converts RJ-45 port from a regular (=) user segment port to a crossover (X) up-link port for on-off connection to a backbone or another cascaded hub.

Packaging:

Enclosure: Rugged, high strength steel enclosure.
Suitable for vertical or horizontal mounting.
Recessed LEDs to avoid damage.

Dimensions:

H40A: 4.4in x 2.9in x 0.75in (11.0cm x 7.4cm x 1.9cm)
H50: 4.8in x 3.3in x 0.75in (12.2cm x 8.4cm x 1.9cm)
H80A: 4.4in x 5.0in x 0.75in (11.2cm x 12.7cm x 1.9cm)
H90: 4.4in x 5.0in x 0.75in (11.2cm x 12.7cm x 1.9cm)

Weight:

H40A and H50:13oz (370gr); H80A and H90:1.0lbs (450gr);
Power Supply: 1.0lbs (455gr)

Cooling method:

Convection

Agency Approvals:

115v 60 Hz Power Supply is UL Listed, CSA certified.
230v 50 Hz Power Supply is same, also GS approved.
Emissions: Meets FCC Part 15 Class A and B, VDE Class B

Warranty:

Three years (see also Appendix A) Made in USA

1.2 Ordering Information

Magnum Personal Hubs

MODEL	DESCRIPTION
Magnum H40A-d	Personal Hub with four standard RJ-45 ports, one with up-link switch, plus one AUI port, external 115 vac 60 Hz power supply.
Magnum H40A-i	Same as H40A-d, but with external 230 vac 50 Hz power supply.
MagnumH50-d	Personal Hub with four standard RJ-45 ports, plus one switched RJ-45 up-link port, external 115 vac 60 Hz power supply.
Magnum H50-i	Same as H50-d except with external 230 vac 50 Hz power supply.
Magnum H80A-d	Personal Hub with eight standard RJ-45 ports, one with up-link switch, plus one AUI port, external 115 vac 60 Hz power supply.
Magnum H80A-i	Same as H80A-d, but with external 230 vac 50 Hz power supply.
Magnum H90-d	Personal Hub with eight standard RJ-45 ports, plus one switched RJ-45 up-link port, external 115 vac 60 Hz power supply.
Magnum H90-i	Same as H90-d except with external 230 vac 50 Hz power supply.

GarrettCom, Inc. reserves the right to change specifications, performance characteristics and/or model offerings without notice.

2.0 INTRODUCTION

This section describes the Magnum Personal Hubs, including appearance, features and possible applications.

2.1 Inspecting the Package and Product

Examine the shipping container for obvious damage prior to installing this product; notify the carrier of any damage which you believe occurred during shipment or delivery. Inspect the contents of this package for any signs of damage and ensure that the items listed below are included.

This package should contain:

1 Magnum Personal Hub

1 External Power Supply, either 115v 60 Hz or 230v 50 Hz

1 Velcro® Tape section, approximately 3 inches in length

1 User Guide

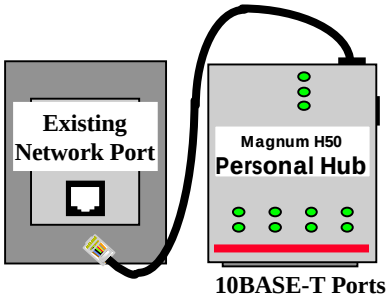
1 Product Registration Card

Remove the Magnum Personal Hub from the shipping container. Be sure to keep the shipping container should you need to ship the unit at a later date. To validate the product warranty please complete and return the enclosed Product Registration Card to GarrettCom, Inc. as soon as possible.

In the event there are items missing or damaged, contact your supplier. If you need to return the unit, use the original shipping container if possible. Refer to Section 5, Troubleshooting, for specific return procedures.

2.2 Product Description

The Magnum Personal Hub is a five or nine-port workplace hub in a very compact package. It is simple to install and use in an office or lab environment, requiring no special rack cabinets or wiring closet apparatus. Personal Hubs are standard physical layer Ethernet products and operate independently of all software.



10BASE-T Ports

Personal Hubs provide a simple and inexpensive solution for networking a personal multi-system office using 10BASE-T twisted pair cabling. They can expand a "power user's" existing single-network-port outlet to provide up to eight extra ports in the immediate office or lab area.

Personal Hubs are also well suited for small- to-medium-size office or lab environments (up to eight persons) that need an independent Ethernet network. They operate as self-sufficient units to provide 10BASE-T Ethernet connectivity for local users and devices. Small independent networks built using Personal Hubs are easily expanded by adding hubs of equal or greater capacity via cascaded connections using the Up-Link switched port feature. The AUI port of the H40A and H80A provide backbone connectivity if required.

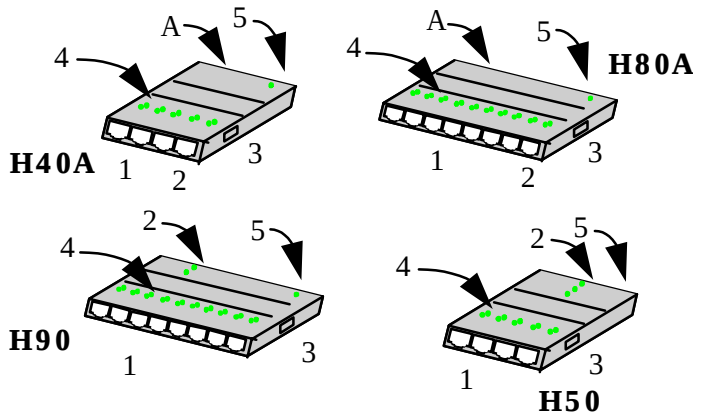
The Personal Hub's small size make them very useful for demonstration situations in conference rooms and in exhibitions where a temporary network or network expansion is needed. They are handy as a piece of test equipment that can be easily inserted into a network to provide a test port, and then removed after the testing is done. Personal Hubs take up minimal space, use minimal power, and are rugged enough to be carried in a coat pocket for possible emergencies.

Personal Hubs fit easily into the workplace environment. They are versatile enough to be table-top, shelf or wall-mounted (refer to Section 3 for installation procedure). All of the wiring connectors are in the same plane so that wiring space is neat and minimal.

The Personal Hub's RJ-45 ports support connection of up to four (H40A), five (H50), eight (H80A) or nine (H90) workstations or other network devices over full length 10BASE-T cable segments. Personal Hubs operate in compliance with the IEEE 802.3 specification for repeater functionality to perform signal amplification, re-timing of data packets, and regeneration of preamble bits for each packet received. Consistent with IEEE 802.3 specifications, Personal Hubs will detect collisions, extend collision fragments, and automatically partition and re-connect individual ports in order to keep problems on one segment from causing downtime elsewhere on the network.

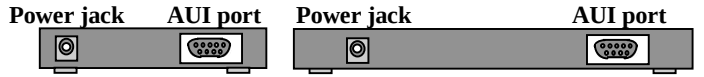
Personal Hubs include LINK and RX LEDs, located on top of the unit above each RJ-45 port, and one LED for power located at the rear near the external power supply connection. The location of the LEDs makes it easy to associate the status LEDs with the corresponding network port.

Each Personal Hubs are supplied one of two external power supply types; one for AC power input of 115 vac 60 Hz, and one for 230 vac 50 Hz. (Refer to Sections 1.1 and 3.0 for detailed information concerning the external power supply.)

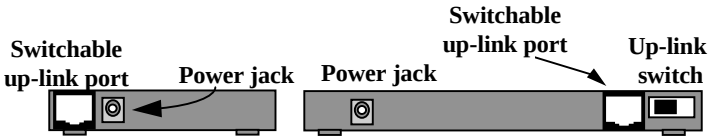


1 - RJ-45	4 - Port LEDs
2 - Switchable up-link	5 - Power
3 - Up-link	A - AUI port

Magnum Personal Hubs: H40A, H80A, H50, H90



Rear view - Magnum H40A **Rear view -Magnum H80A**



Rear view - Magnum H50 **Rear view -Magnum H90**

2.3 Features and Benefits

■ Interconnect to an Existing Ethernet Network

Personal Hubs provide a manual Up-Link switch that allows one RJ-45 port to be to connect into an existing Ethernet environment (such as the central hub for the building or area) via 10BASE-T wiring.

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■ **Inter-operable with other Ethernet Devices**

Personal Hubs are completely inter-operable with other Ethernet-compliant network devices. Each is fully compliant with IEEE 802.3 specifications for 10 Mbps CSMA/CD operation. This allows Personal Hubs to be integrated within any standard Ethernet network and to operate with standard software.

■ **Installation Versatility**

Personal Hubs are simple and easy to install in most any office or lab location. The tiny package is very unobtrusive and is typically mounted with Velcro.

■ **Robust Network Operations**

Personal Hubs use the "star" network topology and have automatic per-port partitioning and re-connection. A fault on one segment is isolated from the rest of the network, avoiding most network downtime.

■ **LEDs Simplify Network Installation and Maintenance**

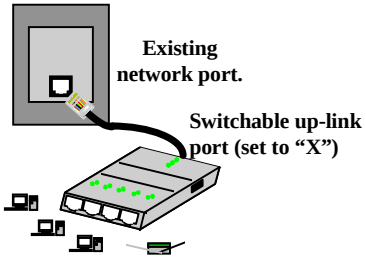
Personal Hubs are equipped with a full complement of LEDs to provide status about basic network activity. LINK LEDs for each port offer a very simple way for operational connections of each 10BASE-T segment to be verified.

■ **Low cost, stand-alone 10BASE-T connectivity**

Operating in a stand-alone environment as a self-sufficient device, Personal Hubs offer a very low cost method of providing small workgroups access to a variety of Ethernet networking services such as file sharing, E-Mail, printer sharing, and other computer information.

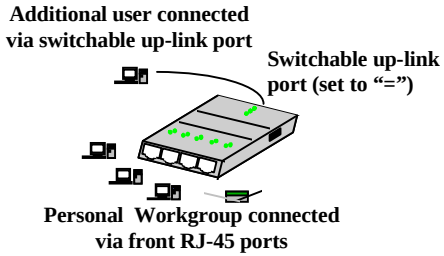
■ **High Quality**

Personal Hubs have a rugged steel case and are compliant with rigid Class CE emission standards, making them suitable for commercial and home offices.



2.4 Applications

Expanding from one to multiple ports at an existing site is easy, and requires no modification to typical building wiring. The installer simply plugs the existing networked device's network cable segment into one of the Personal Hub’s front RJ-45 ports. The Up-Link port (switch set to X) connects via 10BASE-T cabling to the existing network outlet. (The H40A and H80A also allow backbone connection via the rear-mounted AUI port. A mini-transceiver may be connected to this port to provide connectivity to any standard Ethernet media type.) The unit is powered by plugging the external power supply into an AC power receptacle, and connecting the DC power cord into the back of the Personal Hub. In minutes, up to eight (H80A and H90) additional ports are available for networked devices.



Personal Hubs may also be used as a stand-alone network for a personal multi-user system such as shown to the right. Up to nine (H90) user ports are available for 10BASE-T connection, and full-length Ethernet segments are supported on all segments. In this application, the up-link switch is in the straight-through (=) position so that the switchable port is a user port, not an up-link to another hub.

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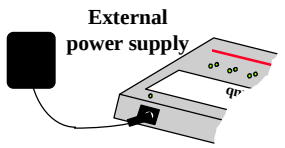
3.0 Installation



Personal Hub power connection - (H80A shown)

The installation of a Personal Hub is a very simple procedure. Locate an AC receptacle that is within six feet (2 meters) of the intended hub location and plug in the external power supply (supplied with unit). The small DC power cord from the power supply plugs into the rear power jack of the Personal Hub. When power is applied the green PWR LED will be illuminated.

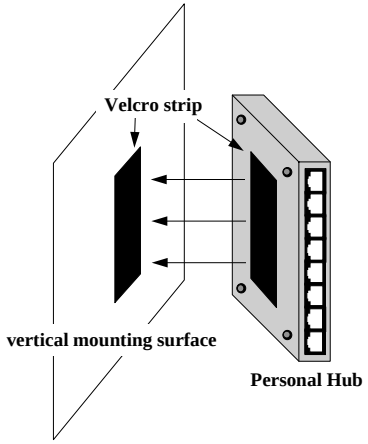
The external power supply unit supplied is one of two types; one for AC power input of 115 vac 60 Hz, and one for 230 vac 50 Hz. Examine the power supply to make sure the type is the right type for your AC power system. The 115 vac unit has a small transformer integral with a convenience power outlet plug. The 230 vac unit has a small transformer integral with an IEC-type power plug for a user-supplied AC power cord with a convenience power outlet plug. Both types include a lightweight DC power cord for connection to the power jack on the Personal Hub unit.

3.1 Table-Top or Shelf Mounting

Personal Hubs are easily mounted on a table-top or shelf, and have four rubber feet to provide stability without scratching finished surfaces. A piece of Velcro may be used to add additional stability if desired. When properly installed, the top-view LED status indicators will be in plain view and easy to read.

The rugged steel case of the Personal Hub will protect it from accidental damage in an office or lab workplace setting. Keep an open area around the unit so that convection cooling can occur while the unit is in operation.

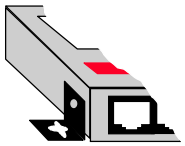
3.2 Wall (or Vertical Surface) Mounting



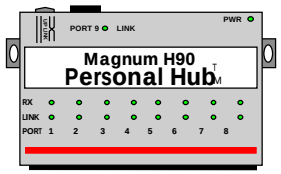
Personal Hub, Velcro mounting

A piece of Velcro mounting tape is supplied with the unit, and may be used to mount a Personal Hub in a vertical position. Adhere one side of the Velcro on the bottom of the hub between the rubber feet. Adhere the other side of the Velcro to the desired vertical mounting location. Typical mounting locations include an office wall surface, the side of a server unit cabinet or the back of a desk.

As an alternative, small brackets may also be used for mounting the Personal Hub. The metal screws in each side of the Personal Hub's case may be used to attach the brackets. Use of the optional brackets permits the Personal Hub to be mounted in almost any desired orientation or position.



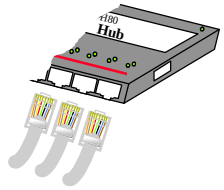
Proper mounting bracket attachment



Personal Hub, optional mounting brackets

3.3 Twisted Pair Connections

1. Using standard 10BASE-T media, insert the one end of the network cable into one of the RJ-45 ports on the Personal Hub. Even though the hub's ports are of the shielded type, they will accept and operate properly with shielded and unshielded type RJ-45 twisted pair wiring.



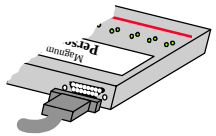
Twisted pair connections - Magnum Personal Hub

2. Connect the other end of twisted pair segment to the desired workstation or user device. The port's LINK LED will be lit when the connection is made on both ends of the segment and DC power is present, i.e., when the segment circuit is established and is ready to use.

3. For information on using the up-link port, refer to Section 3.5.

3.4 AUI Connection (Models H40A and H80A only)

Using the steps below as a guide, attach a new or existing 10BASE5 ThickNet drop-cable directly to the AUI connector on the rear of the Magnum H40A or H80A.



AUI connection - Magnum H40A and H80A

1. Plug the male end of the cable into the female AUI connector on the Personal Hub.

2. Engage the AUI connector slide lock to insure maximum connectivity.

3. Connect the opposite end of the cable into a network AUI port. (This could be a network backbone transceiver, a hub or fan-out with an AUI port, or an AUI Port Module in a concentrator.)

The AUI port may also used for connecting to other Ethernet devices using standard AUI cabling. In this type of situation, it is important to consider the AUI segment length to the attached device, including any cascading.

The maximum transmission distance between a backbone transceiver and the AUI port of the Personal Hub will vary. According to Ethernet standards, when an AUI cable is used to connect the Personal Hub directly to a backbone transceiver, the maximum AUI segment length of 50m (165 ft.) is allowed. If the Personal Hub is connected to a transceiver that has been cascaded from another transceiver, the maximum AUI segment length is reduced by 6 meters (20 feet), for every additional transceiver device cascaded from the original backbone transceiver tap..

The AUI connector of the Personal Hub supports standard IEEE signals, which are summarized in Table 3.4

Table 3.4 AUI Pin Assignments

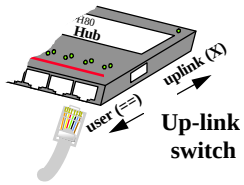
Pin	Function	Pin	Function
1	Control In Circuit Shield	10	Data Out Circuit B
2	Control In Circuit A	11	Data Out Circuit Shield
3	Data Out Circuit A	12	Data In Circuit B
4	Data In Circuit Shield	13	Voltage Plus (+)
5	Data In Circuit A	14	Voltage Shield
6	Voltage Common	15	Control Out Circuit B
7	Control Out Circuit A	SHELL	Protective Ground
8	Control Out Circuit Shield (conductive shell)		
9	Control In Circuit B		

NOTES: 1) Voltage Plus (pin #13) and Voltage Common (pin # 6) use a single twisted pair in the AUI cable.

2) Pins 4, 8, 11 and 14 may be connected to pin #1.

3.5 Switchable Up-Link Feature

Each Personal Hub is equipped with one switchable up-link port, which eliminates the need for a special cross-over cable when cascading to hub or concentrator. This port



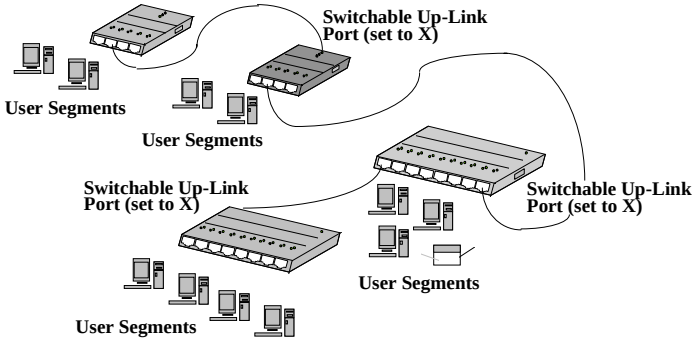
Personal Hub up-link switch (H80A shown)

is either the rear RJ-45 port (H50 and H90) or the right-most front RJ-45 port (H40A and H80A). This switch is used to select either a normal 10BASE-T connection to a user device (switch in the "==" position) or a 10BASE-T network up-link connection to another hub or concentrator (switch in the "X" position).

NOTE: *When the switchable port is connected for up-link but the switch is set to the == position, the up-link segment is inoperative and full bandwidth is available locally.*

3.6 Cascading Personal Hubs with the Up-Link Port

Personal Hubs may be cascaded in order to expand networks. The switchable up-link port (set to the X position) is normally used to connect the Personal Hub to any port of another hub. Also, the Models H40A and H80A may be connected to a backbone via the rear AUI port. With the addition of a mini-transceiver, the AUI port may be used to connect to any standard Ethernet media. Since each Personal Hub provides full repeater functionality, cascaded units can operate together even though there may be a full segment of distance between them.



Cascaded Personal Hubs: Full Repeater Functionality

NOTE: *Based on the "four repeater rule" defined by Ethernet standards, there may normally be a maximum of four units in any one chain between any two users.*

Personal Hubs may also be cascaded with other Magnum Hubs (such as Magnum 1000 Workgroup Hubs and Magnum 3000 Stackable Hubs and Concentrators) as well as with Ethernet hubs from other manufacturers.

4.0 OPERATION

This section details the various operational features of Magnum Personal Hubs, including a description of the LED indicators. All Personal Hubs are fully compliant with the Ethernet Version 2/IEEE 802.3 Repeater Specification for CSMA/CD 10Mbps operation and will function accordingly.

4.1 Functional Operation, Use of LED Indicators

Power On (PWR) LED: Illuminates GREEN to show functional DC power.

Link Status (LINK) LED (per port): Illuminates GREEN when proper connectivity on the 10BASE-T network segment is established. Each LINK LED will turn off independently if connectivity or power is lost on the port's twisted pair segment.

Note: *When the switchable port is wired for up-link to another hub, the LINK LED will normally be on when the up-link switch is set to the X position. With the up-link switch off (== position), the LINK LED is off as the up-link is disabled. This permits local operation of the Personal Hub with full bandwidth.*

Receive Packets (RX) LED (per port): Illuminates intermittently in GREEN to indicate that data packets are being received from the segment. This provides a visual indication of network activity for re-assurance of normal operation, and is also useful in troubleshooting.

Note: *Blinking indicates activity. The rate at which the RX LED blinks is associated with the data transfer intensity on some models, and is a fixed rate on other models.*

Partitioning and Re-connection: Personal Hubs will automatically partition a port when 32 consecutive collisions occur or after 6.5 ms of continuous transmission. Network integrity is checked every 800 ms and segment re-connection occurs after one 512-bit packet is transmitted without an error.

Preamble Regeneration: Personal Hubs add bits to the preamble so that the output packet contains a minimum 64-bit preamble per the Ethernet standard.

Collisions: When carrier is detected simultaneously on multiple ports, a jam pattern is generated on each port to create a collision condition. When a collision signal from one port is detected, it generates a jam pattern to other ports.

Fragment Extension: Personal Hubs will automatically add bits to a received data packet of less than 96 bits (a "fragment") so that the repeated packet is 96 bits long.

5.0 TROUBLESHOOTING

All Magnum Ethernet products are designed to provide reliability and consistently high performance in all network environments. The installation of Personal Hubs is a simple procedure (see Section 3.0, INSTALLATION); operation is very simple and is described in Section 4.0, OPERATION.

Should problems develop during installation or operation, this section should help to locate, identify and correct such problems. Please follow the suggestions listed below contacting your supplier. However, if you are unsure of any procedure described in this section, or if the Magnum Personal Hub is not operating as expected, do not attempt to repair or alter the unit. Contact your supplier (or if unknown, contact GarrettCom, Inc.) for assistance.

5.1 Before Calling for Assistance

1. If difficulty is encountered when installing or operating the Magnum Personal Hub, refer to Section 3.0, Installation and Section 4.0, Operation. Check to make sure that the various other components of the network are operable.
2. Check the cables and connectors to ensure that they have been properly connected, and the cables have not been crimped or in some way impaired during installation. (About 90% of network downtime can be attributed to wiring and connector problems.)
3. Make sure that the external DC power supply is properly attached to the unit, that it is of the proper type, and that it is plugged into a functioning electrical outlet. Use the PWR LED to verify the unit is receiving proper power.
4. If the problem is isolated to a network device other than the Personal Hub, replaced the problem device with a known good device. Verify whether or not the problem is corrected. If not, go to Step 5 below. If the problem is corrected, the Personal Hub and its associated cables are functioning properly.
5. If the problem continues after completing Step 4 contact your supplier of the Personal Hub (or if unknown, contact GarrettCom, Inc.) by fax, phone or email for assistance.

5.2 When Calling for Assistance

Please be prepared to provide the following information.

1. A complete description of the problem, including the following points:

   a. The nature and duration of the problem;

   b. Situations when the problem occurs;

   c. The components involved in the problem;

   d. Any particular application that, when used, appears to create the problem;

2. An accurate list of GarrettCom product model(s)involved, with serial number(s). Include the date(s) that you purchased the products from your supplier.

3. It is useful to include other network equipment models and related hardware, including personal computers, workstations, terminals and printers; plus, the various network media types being used.

4. A record of changes that have been made to your network configuration prior to the occurrence of the problem. Any changes to system administration procedures should all be noted in this record.

5.3 Return Material Authorization (RMA) Procedure

All returns for repair must be accompanied by a Return Material Authorization (RMA) number. To obtain an RMA number, call GarrettCom Customer Service at (510) 438-9071 during business hours in California or email to *support@garrettcom.com*). When calling, please have the following information readily available:

Name and phone number of your contact person.
Name of your company / institution
Your shipping address
Product name
Serial Number (or Invoice Number)
Packing List Number (or Sales Order Number)
Date of installation

GarrettCom will carefully test and evaluate all returned products, will repair products that are under warranty at no charge, and will return the warranty-repaired units to the sender with shipping charges prepaid (see Warranty Information, Appendix A, for complete details). However, if the problem or condition causing the return cannot be duplicated by GarrettCom, the unit will be returned as:

No Problem Found.

GarrettCom reserves the right to charge for the testing of non-defective units under warranty. Testing and repair of product that is not under warranty will result in a customer (user) charge.

5.4 Shipping and Packaging Information

Should you need to ship the unit back to GarrettCom, please follow these instructions:

1. Package the unit carefully. It is recommended that you use the original container if available. Units should be wrapped in a "bubble-wrap" plastic sheet or bag for shipping protection. (You may retain all connectors and this Installation Guide.)

   CAUTION: Do not pack the unit in Styrofoam "popcorn" type packing material. This material may cause electro-static shock damage to the unit.

2. Clearly mark the Return Material Authorization (RMA) number on the outside of the shipping container.
3. GarrettCom is not responsible for your return shipping charges.
4. Ship the package to:

   GarrettCom, Inc.
   47823 Westinghouse Drive
   Fremont, CA 94539
   Attn.: Customer Service

APPENDIX A: WARRANTY INFORMATION

GarrettCom, Inc. warrants its products to be free from defects in materials and workmanship for a period of three (3) years from the date of shipment by GarrettCom.

During this warranty period, GarrettCom will repair or, at its option, replace components in the products that prove to be defective at no charge other than shipping and handling, provided that the product is returned pre-paid to GarrettCom.

This warranty will not be effective if, in the opinion of GarrettCom, the product has been damaged by misuse, misapplication, or as a result of service or modification other than by GarrettCom.

GarrettCom reserves the right to make a charge for handling and inspecting any product returned for warranty repair which turns out not to be faulty.

Please complete the warranty card as this acts as a product registration, and mail it to GarrettCom within two weeks of your purchase.